

In the Drawings:

Please replace the original single sheet of drawings with the enclosed Replacement Sheet. In the Replacement Sheet, the clarity of lines, numbers, and figure legends has been formally improved. Also, the previously missing reference number "4" has been added in Fig. 1, in conformance with the specification at page 3 line 30, page 4 line 1, etc. Thus, no new matter has been introduced. Entry and approval of the Replacement Sheet are respectfully requested.

[RESPONSE CONTINUES ON NEXT PAGE]

REMARKS:

- 1) According to the PCT procedures, the original specification of this application was a direct literal translation of the corresponding PCT international application text. The specification has now been amended in a formal and editorial manner, to better conform to typical US application style and content, and to clarify a few text passages. The Title has been amended to conform to the Title of the counterpart PCT WO publication, and in the USPTO database. These merely editorial amendments do not introduce any new matter. Entry thereof is respectfully requested.
- 2) The original claims of this application were a direct literal translation of the corresponding claims of the PCT international application. Claim 1 has been amended to expressly recite that the swashplate is connected with the first turntable via at least one pin such that the pin will transmit torque from the first turntable to the swashplate, as supported in the original specification, for example at page 4 lines 8 to 15. Claims 2 and 3 have been formally amended to avoid an interpretation thereof with "product-by-process" features. Claims 2 and 3 now instead expressly recite product features without process limitations. These amendments do not introduce any new matter. Entry and consideration of the claim amendments are respectfully requested.

- 3) Referring to section 1 on pages 2 to 3 of the Office Action, the Examiner's attention is directed to the enclosed Drawing Transmittal with one Replacement Sheet of revised drawings. The clarity of lines, numbers, and figure legends has been improved to comply with the Notice of Patent Drawing Review. Also, the previously missing reference number "4" has been added to expressly label the camshaft, in conformance with the specification and the claims. Thus, all claim elements have been illustrated, and no new matter has been added. Approval and entry of the Replacement Sheet, and withdrawal of the drawing objection, are respectfully requested.
- 4) Referring to section 2 on page 3 of the Office Action, the objection to the disclosure has been addressed, i.e. the revisions requested by the Examiner have been included in the present amendment of the specification. Thus, please withdraw the objection to the disclosure.
- 5) Referring to section 4 on page 4 of the Office Action, the rejection of claims 1 to 3, 11 and 15 as anticipated by US Patent 6,523,512 (Axmacher et al) is respectfully traversed.

Present independent claim 1 has been amended to clarify how the at least one pin (2.2) connects the swashplate (2) with the first turntable (1). Particularly, this connection is a torque-transmitting connection in which the pin will transmit torque from the first turntable to the swashplate. This is clear from the original specification at page 4 lines 8 to 15 (also see Fig. 2). For example, in a particular embodiment, the pins (2.2)

protrude radially outwardly from a rim of the swashplate (2) and engage in four recesses (1.1) in a cup-shaped rim of the camshaft gear (1) as shown in Figs. 1 and 2. This connection provided by the pins (2.2) directly transmits torque from the camshaft gear (1) to the swashplate (2) via the pins (2.2) (page 4 lines 8 to 15). Such a torque-transmitting connection via at least one pin is not provided and would not have been suggested by Axmacher et al.

Axmacher et al disclose a gear arrangement with a wobble plate or swashplate mechanism arranged between a camshaft and a crankshaft. It can be said that the arrangement includes two turntables interconnected via a swashplate of the wobble plate mechanism, wherein the swashplate is connected with the second turntable via gear rings. In the asserted embodiment of Fig. 4, the swashplate is divided into two wobble plates (3a, 3b). The second wobble plate or swashplate (3b) is connected with the second turntable (2.1) via gear rings (3.2, 2.2). Pins (3.3) extend axially between the two wobble plates (3a, 3b) so as to transmit the wobbling motion in an axial direction from the first wobble plate (3a) to the second wobble plate (3b).

In this regard, the pins (3.3) extend through openings in the component (1.1) of the camshaft (1), but the pins (3.3) do NOT connect the swashplates or wobble plates (3a, 3b) to the disk component or turntable (1.1) of the camshaft in a torque-transmitting manner. Especially, the pins (3.3) do **not** provide a torque-transmitting connection such that the pins will transmit torque from the turntable (1.1) to the swashplate (3a, 3b). To the contrary, the pins (3.3) transmit an axial force

from the first wobble plate (3a) to the second wobble plate (3b) to impose the wobbling motion of the first wobble plate onto the second wobble plate. Namely, the rotation of the first wobble plate relative to the second wobble plate causes an axial movement of the pins. This action changes the wobbling or tilting orientation of the swashplate, but does not connect the swashplate with the first turntable, i.e. does not transmit any rotational torque from the first turntable to the swashplate. In this regard, see Fig. 4, column 4 line 61 to column 5 line 19, and column 7 line 9 to column 8 line 3 of the Axmacher et al patent.

There would have been no suggestion to provide a torque-transmitting connection via the pins (3.3), because there is no disclosure and no suggestion of connecting the pins to the swashplates in a rotationally-engaged and torque-transmitting manner. The only torque-transmitting engagements are between the second wobble plate (3b) and the camshaft wheel (2, 2.1) via the gear rings (2.2, 3.2), as well as between the wobble plate (3b) and the camshaft turntable component (1, 1.1) via the gear rings (1.2, 3.1) (see column 4 line 5 to column 5 line 19). There is no disclosure and no suggestion toward providing a torque-transmitting connection from the turntable component to the swashplate via the pins (3.3), and that would have served no purpose, because there is a torque-transmitting connection from the swashplate (3b) to the turntable (1.1) via the gear rings (1.2, 3.1).

For the above reasons, the invention of present claim 1 is not anticipated by (and would not have been obvious over) the

disclosure of Axmacher et al. The dependent claims 2, 3, 11, and 15 are patentable already due to their dependence from claim 1. Furthermore, claims 2 and 3 have been amended to make clear that a "product-by-process" limitation is not intended. Instead, claims 2 and 3 now recite concrete product features that are not disclosed and would not have been suggested by Axmacher et al. Particularly, the construction according to Axmacher et al would not have been functional for its intended purpose if the pins (3.3) were one piece with the swashplate or the first turntable, or if the pins were connected to the swashplate or the first turntable by a solid rigid joint such as a glue joint, a weld joint, a force fit joint, a solder joint, or a screw joint.

For the above reasons, the Examiner is respectfully requested to withdraw the rejection of claims 1 to 3, 11 and 15 as anticipated by Axmacher et al.

- 6) Referring to section 6 on pages 5 to 6 of the Office Action, the rejection of claims 1 to 3, 11 and 15 to 17 as obvious over Axmacher et al is respectfully traversed.

Present independent claim 1 has been discussed above in comparison to Axmacher et al. The above discussion is re-asserted in connection with the present rejection.

In the present obviousness rejection, the Examiner asserts *"it would have been obvious to one having ordinary skill in the art ... to have utilized ... a pin to connect a swashplate with a turntable, ... since the use would provide a more direct and controllable and valve timing train"*. The Examiner's assertion is respectfully traversed, in view of the above discussion.

First, Axmacher et al do not provide any suggestion or motivation that such a use of a pin "would provide a more direct and controllable valve timing train" as asserted by the Examiner. This motivation proposed by the Examiner seems to have come only from a post hoc rationalization or explanation of the present invention reconstructed based on hindsight knowledge of this application. Secondly, Axmacher et al do not teach anything about using pins to provide a torque-transmitting connection from the first turntable to the swashplate. Instead, as discussed above, the pins (3.3) only provide an axial force transmission to impose a wobbling motion on the second swashplate (3b) from the motion of the first swashplate (3a). The torque-transmitting connection from the swashplate (3b) to the turntable (1.1) is via the gear rings (1.2, 3.1). Note that the swashplate (3b) has gear rings on both opposite axial faces or sides thereof. Thus, it would have been without purpose or function, and thus non-obvious to provide a torque-transmitting connection via the pins (3.3). Also, such a torque-transmitting connection via the pins (3.3) would have been functionally incompatible with the different rotation speeds and variable gear ratio to be provided through the gear, namely that the swashplate (3b) rotates at a different speed from the turntable (1.1). Note that the swashplate (3b) is mounted coaxially on the turntable (1.1) via a rotation bearing, particularly a ball bearing, to allow rotation and wobbling therebetween (column 5 lines 3 to 19, column 7 line 9 to column 8 line 3, and Fig. 4).

For the above reasons, the invention of present claim 1 would not have been obvious over Axmacher et al. The dependent claims are patentable already due to their dependence. Claims 2 and 3 as amended recite concrete product limitations rather than product-by-process limitations.

For the above reasons, the Examiner is respectfully requested to withdraw the rejection of claims 1 to 3, 11 and 15 to 17 as obvious over Axmacher et al.

- 7) Referring to section 7 on page 6 of the Office Action, the rejection of claims 12 to 14 as obvious over Axmacher et al. in view of US Patent 4,515,110 (Perry) is respectfully traversed.

Claims 12 to 14 depend from claim 1, which has been discussed above in comparison to Axmacher et al.

The Examiner has additionally cited Perry for disclosing the arrangement of a bushing as a counter bearing on a pin or in a recess. While Perry generally discloses the use of a bronze bushing, there would have been no further suggestions toward the structural features and arrangement of a swashplate or wobble gear mechanism according to present independent claim 1 as discussed above, because Perry provides no additional teachings in this regard. Thus, even a combination of Perry with Axmacher et al. would not have made the invention of claim 1 and its dependent claims obvious.

The Examiner is respectfully requested to withdraw the rejection of claims 12 to 14 as obvious over these references.

- 8) Favorable reconsideration and allowance of the application, including all present claims 1 to 3 and 11 to 17 are respectfully requested.

Respectfully submitted,
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Applicant

WFF:sk/4754
Enclosures:
Transmittal Cover Sheet
Drawing Transmittal
1 Replacement Sheet
postcard

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I hereby certify that this correspondence with all indicated enclosures is being deposited with the U. S. Postal Service with sufficient postage as first-class mail, in an envelope addressed to: COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450 on the date indicated below.

Walter F. Fasse 6/7/06
Name: Walter F. Fasse - Date: June 7, 2006